Volume 75

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OCTOBER 1958

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ARCHIVES OF PEDIATRICS

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EMERGENCY LUNG RESECTION DUE TO A MASSIVE HEMOTYSES IN AN INFANT WITH LUNG ABSCESS†

J. E. RIVAROLA, M.D.,* L. A. FUMAGALLI, M.D.* and A. J. RIVAROLA, M.D.*

The field of thoracic surgery in infants is becoming more vast, and in certain cases the life of the infant depends on the rapid decision to perform an emergency operation. Such emergencies turn up in cases of spontaneous hypertensive valvular pneumothorax and in emphysema of mediastinum. In these cases the operation is small but life-saving; a simple drainage or a simple tapping can solve a serious condition.

The complication which occurred in the course of a pulmonary abscess in a child whose case report follows, obliged us to perform a drastic emergency operation as the sole solution to save the child's life.

R.J.G. A four-month old male infant was admitted to the Surgical Department on the eighth of August 1955 with an intussusception of twelve hours duration. On admission child was acutely ill, remaining prostrated, with marked pallor. Other positive findings were a slightly distended abdomen and a tumor was palpated in the L.L.Q. Digital palpation of rectum discovered head of intussusception and the presence of bloody mucus on finger as it is withdrawn. Barium enema confirmed the diagnosis but was unsuccessful in reducing the invagination further than the descending colon.

The infant was given a subcutaneous clysis of 150 cc. of normal saline and 150 cc. of 5% glucose solution, and a transfusion of 60 cc. of plasma.

*Department of Surgery, Children's Hospital, Buenos Aires.
†Published in the "Archivos Argentinos de Pediatria" 46:14, 1956.

The operation was commenced on the infant under ether drop anesthesia. Before opening the abdominal wall, the infant vomited and aspirated the vomitus, causing his breathing to stop. Aspiration was performed and he was given coramine and lobeline. After 10 minutes of artificial respiration spontaneous breathing returned.

The operation was resumed and the ileocolic intussusception was reduced with great difficulty. A long retrocecal appendix was found to be cyanotic, and at the level of the iliocecal valve there was a marked edema and the terminal part of the ileum appeared to be filled by a tumor. An unsuccessful attempt was made to reduce the swelling with hot damp compresses and slight pressure.

Fig. 1. Twelve days after the operation for intussusception, there were two shadows in both upper lung fields. The left lateral shows a round shadow with sharp contour in the posterior field of the upper lobe

A latero-lateral anastomosis was then made between the terminal ileum and the ascending colon.

During the operation the infant received a transfusion of 120 cc. of blood, and an intestinal aspiration tube was passed through the nose to the stomach and was then manually advanced to the small intestine.

Post-operative course. Infant was put in an oxygen tent, and he continued febrile and dyspneic for three days. He was given antibiotics and subcutaneous fluids, and continuous intestinal aspiration was done.

On the fourth post-operative day his general condition improved, the dyspnea diminished, he became afebrile, intestinal aspiration was discontined and oral feeding was commenced.

On the twelfth post-operative day his coughing increased, he became febrile and his general condition got worse.

An A.P. x-ray of chest showed opaque areas in both upper fields. The lateral x-rays showed a round shadow with a sharp

contour in the posterior field of the left upper lobe, and a more diffuse shadow in the anterior field of the right upper lobe.

With the diagnosis of bilateral abscesses due to aspiration of gastric contents, bronchial aspirations were commenced.

After two days, having had two bronchial aspirations, x-ray revealed excavation of left shadow and the right one began clearing. After one week of bronchial aspirations in which abundant mucopurulent fluid was extracted and sulfathiazole was instilled, the x-ray revealed the left side to have a typical image of lung abscess with a fluid level, and the right shadow was replaced by a pneumatocele.

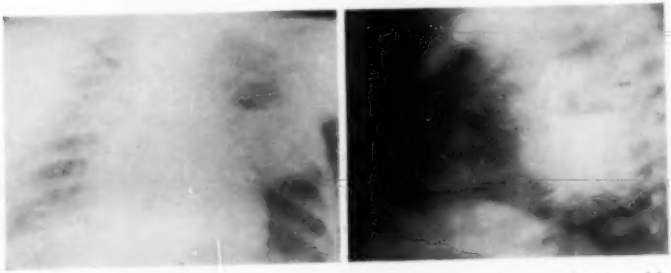

Fig. 2. Eleven days later there is a typical shadow of a lung abscess with a fluid level. In the right field, a pneumatocele has replaced the previous opacity

The laboratory data showed a slight anemia with a WBC. of 13,800 with predominance of younger forms.

During this time the infant continued febrile, with cough and slight dyspnea. Postural drainage was added to the previous treatment.

On the seventh of September, the infant had a marked coughing spell accompanied by the bringing up of the abscess' contents which included clots of blood. The x-ray showed the abscess to be empty, and a favorable prognosis was considered.

Two days later while in his mother's arms, the infant had a coughing spell followed by a massive hemoptysis. He was put face down and in the mother's words "there was a continuous flow of blood as though it were coming out of a tap."

Considering the intensity of the hemorrhage and the possibility of its recurring it was decided to perform the operation immediately.

Operation. Intratracheal ether anesthesia. Postero-lateral thoracotomy through the sixth left intercostal space. Pleura was opened

and it was necessary to separate the adhesion of the abscess wall to the pleura. The affected lobe had a pale color in contrast to the healthy lobe, due most likely to the impairment of the circulation. The abscess zone had a dark wine-red color. Dissection of the pedicle was commenced to resect the upper lobe, respecting the lingula. The pedicle had an infarcted node which was resected. At this moment a large hemorrhage commenced in the open abscess cavity which obliged us to ligate the entire pedicle, and this was made easier by the fact that the upper lobe had already been separated from the lower lobe. This ligature stopped the

Fig. 3. x-ray taken immediately after the coughing spell in which contents of abscess were evacuated. The pneumatocele is still present in the right lung

hemorrhage. The lobectomy was performed and the bronchial stumps were sutured and then covered by a free graft of healthy pleura taken from the resected lingula. The presence of bubbles of air in the postero-superior part of the lower lobe where the abscess was adhered to, was corrected by a continuous suture and the pleural cavity was cleaned free of blood clots. The thoracotomy was closed leaving an antero-posterior and a postero-inferior drainage.

During the operation 600 cc. of blood were transfused, representing the total volume of the infant who weighed six kilograms.

Post-operative course. On the twelfth of September the drainage tubes were removed. On the fourteenth, the presence of a bloody secretion from the surgical incision was followed by an opening of the wound. Antibiotics were introduced locally and a drainage tube was introduced in the anterior end of the wound. Nine days later this tube was removed, followed by healing of the wound.

The infant's course continued uneventful, he improved rapidly and has continued well, having been followed in the O.P.D. up to date.*

Pathology report. Macroscopic examination: Lung tissue with little air due to congestion surrounding a small mass about the size of a pigeon egg which has a well defined contour. In the interior of this mass there are abundant blood clots which, once removed, show some thrombosed blood vessels protruding from the wall.

Microscopic examination: Samples are taken from the border of the cavity. The wall is irregular with a large quantity of fibrin

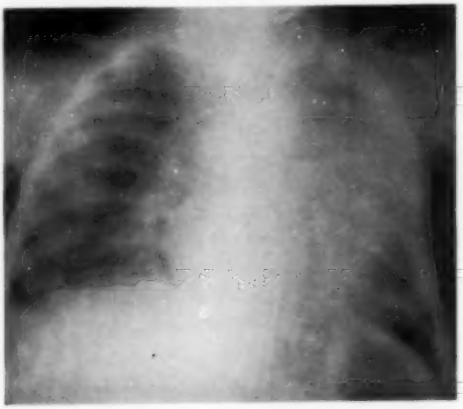

Fig. 4. Two and a half months after lobectomy, x-ray shows a complete pulmonary expansion. A thickening of pleura and soft tissue still persist

and tissue tending to necrosis, partially surrounded by a layer of connective tissue. There are large thrombosed veins in the process of organization, with abundant collections of bacteria. The destructive process is really detained by interlobular fibrous layers containing vessels. Next to this process there are alveoli with abundant histiocitic elements, leukocyte infiltration, fibrin and red cells.

Large bronchi with cartilaginous areas containing fibrinous and leukocytic exudate which partially occludes the lumen. Medium-sized bronchi with exudate totally occluding the lumen and which produces areas of partial atelectasis. There are areas of red infarcts with necrosis in the vicinity.

*EDITOR'S NOTE: Doctor Rivarola reports that the child operated on for the emergency lung resection is in perfect health and has had no trouble in these two years.

Diagnosis: Abscess of lung with thrombosis (hematic origin of the lesion).

DISCUSSION

1. With reference to the intussusception, the method employed is a simple procedure to solve a serious situation, especially uncertain from the anatomo-pathological point of view, namely, a simple short-circuit anastomosis in lieu of a resection. In the presence of a tumor, a resection should be performed, but when in doubt as to whether the tumor is inflammatory or neoplastic (in which case the treatment is different), the frozen biopsy is the only way to help in solving the problem. In our case, the respiratory distress of the infant, and the absence of a pathologist to examine the biopsy, was the reason for our procedure. The following observations and careful palpation of the infant's abdomen, lead us to the conclusion that the tumor was of an inflammatory nature.

2. With reference to the accident, it is lamentable that the emergency service did not have a specialized anesthetist to perform an intratracheal intubation and to cope with the accident. Had this infant been anesthetized with an endotracheal anesthesie, it is most likely that no complication would have occurred.

3. The measures employed to combat the massive hemorrhage, might seem at first view to be too drastic. But if we consider that infants tolerate hemorrhages very poorly, and that the imminent danger of a repetition could have been mortal not only because of the loss of blood but because of the massive bronchial inundation, the lobectomy seems justified. On the other hand, there is a tendency today to use the most radical method in treating lung abscesses. Bosher[1] gives the following indications for the primary resection: 1—Multiple pulmonary abscesses. 2—Abscesses with associated bronchial stenosis. 3—Chronic course with fibrosis and secondary bronchiectasis. 4—Suspicion of carcinoma or bronchial adenoma. 5—Suspicion of infected congenital cyst. 6—Abscess in some manner inaccessible to drainage. 7—Simple abscess which does not respond to antibiotics. To these can be added another indication mentioned by Linsdkeg and Liebow;[2] recurrent hemorrhages.

Lung resections in adults have been done in cases of massive hemorrhages due to pulmonary tuberculosis. Fox[3] in 1955, and

Ross[4] in 1953, mention several cases operated on with good results. In Bosher's[1] review of 130 lung abscesses, there were four deaths due to hemorrhage and three serious hemorrhages which were not fatal in the sixty-three cases treated with simple pneumotomy. The incidence of mortality indicates that resection is advisable in these cases.

Fig. 5. Child seven months after lobectomy

Giraud[5] in 1951, presents the only observation similar to our case; an infant with an infected congenital cyst who suffered from recurring hemoptyses and was lobectomized with good results.

4. The x-ray studies of the infant after the accident, showed the presence of a typical lung abscess in the left upper lobe, and a pneumatocele in the right lobe. The majority of authors that have dealt with this subject have not exactly related the lung abscess with the pneumatocele that appears in the midst of infectious lung condensations in infants. The real lung abscess such as the one this infant had, pertains more to that of an adult, and it is generally accepted that the predominant factor in its genesis is the aspiration of infected matter rather than vascular embolus. These

abscesses are relatively rare in infants and are of a more rapid course than in adults. On the other hand, the post-pneumonic pneumatocele is seen almost only in infants. Caffey[6] admits that in the formation of a pneumatocele there is a destructive factor that cannot be discarded, but the principal factor in the development of the air cyst is the insufflation due to an obstructive mechanism. Its course is completely benign and usually should not be treated. In the abscess, the destruction of tissue is the cause of the cavity formation. The relation between lung abscess and post-pneumonic pneumatocele, and the simultaneous presence of both complications with the same onset, is not altogether clear.

5. The pathology report indicates an hematic origin of the lesion. Considering the flooding of the bronchi by the vomitus during the anesthesia, and the absence of visible septic foci which could have caused pulmonary emboli, we believe that in this case the cause of the abscess was the aspirated matter.

SUMMARY

1. The case report of a four-month old infant is presented; the case was admitted because of an intussuception which was reduced surgically. This was followed by an abscess of the lung which thirty days later caused a massive hemoptysis which required an urgent lobectomy. The infant was discharged in good health.

2. The method of surgically solving the invagination and the complication caused by aspiration of the vomitus during the operation are discussed.

3. The surgical treatment of the massive hemoptyses is commented on, and a review of the literature is made of similar cases.

4. The pathogenesis of the abscess in this infant is considered together with the problem of the simultaneous appearance of a pneumatocele in the other lung.

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LISTERIA MENINGITIS IN INFANCY

A Report of Two Cases

MILTON O. KEPLER, M.D.*

Fayetteville, N. Y.

"Listeriosis" means any infection by the organism *Listeria monocytogenes*. Attention was first directed to this organism as a cause of disease in animals. The organism was first indicted and described as the causative agent of an epizootic of guinea pigs and rabbits in 1926. The monocytosis seen in rabbits with this infection gave rise to the current name. *Listeria monocytogenes* is now the preferred term, but the organism has also been called *Bacterium monocytogenes*, *Listerella monocytogenes*, *Listerella hepatolytica*, and *Erysipelothrix*. The first report of listeria meningitis in humans was in 1932. Sporadic cases of human listeriosis, including meningitis were reported from time to time. In the last decade, however, an increasing number of cases of human listeriosis and listeria meningitis have been reported. All authors believe the disease to be more common than generally realized, and cite failure to recognize the organism as the chief reason for this misconception. If the organism is suspected, it is readily identified. One of the latest and most comprehensive reviews on this subject has been written by Hoeprich.[8] Many of the human cases reported have been in infants. The commonest clinical form of the disease in all ages is meningitis. The purpose of this paper is to report two new cases of Listeria meningitis in newborn and to emphasize:

1. Its importance as a pediatric disease.
2. Its minimal or misleading symptoms.
3. The importance of keeping the possibility of such a disease in mind.
4. Frequent failure to recognize the infecting organism.
5. The frequent absence of "meningeal signs."
6. The importance of early collection of spinal fluid and blood specimens for culture and examination.
7. The possibility of the mother as a source of infection.
8. The antibiotic sensitivity of the organism may vary.
9. The difficulties in early recognition of *any* meningitis in the newborn infant.

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The following two cases from the Oakland, California area serve to illustrate some of these points.

CASE NO. 1

A seven day old negro female infant was seen in the out-patient department with a two-day history of irritability, and taking feedings poorly. Physical examination was unrevealing except for a temperature of 101.2° and the patient was discharged with instructions to increase fluid intake. Four hours later, the infant was returned to the clinic because it had had two seizures described as "breath-holding" with generalized stiffening of the extremities. Again the physical examination was unrevealing. Diagnostic impression was possible sub-dural hematoma, possible meningitis, hypocalcemia or hypoglycemia. She was admitted to the hospital for further observation.

A review of the birth history revealed that the mother's membranes had ruptured about 60 hours prior to delivery, and that she was given no antibiotics. She had remained afebrile. Labor had been induced with intravenous pitocin drip. The baby was described as anoxic at birth, but good respirations had been established 5 to 10 minutes after suctioning and continuous oxygen by mask. The baby had done well in the nursery, and had taken feedings of a standard evaporated milk formula without difficulty. The infant and mother had been discharged 3 days after birth with no further difficulties.

On admission, a lumbar puncture revealed a grossly bloody fluid which was cultured, but no organism was seen on a direct Gram stain. Subdural taps were performed bilaterally, and were unproductive of more than a few drops of clear fluid. The hemoglobin was 16.5 gm., the white blood count was 24,000 with 57 polys, 22 bands, 2 metamyelocytes and 19 lymphocytes. A chest x-ray was interpreted as normal. On the first hospital day, the baby took its feedings well. Irritability was noted and the temperature gradually rose to 102.2°. The infant began to have frequent loose, yellow stools and frequent urination. No signs of meningeal irritation were elicited. The next day some nuchal rigidity and some opisthotonus were noted. A loss in weight was noted, and attributed to the diarrhea and diminishing oral intake. Intravenous fluids were commenced consisting of mixtures of sodium lactate, normal saline, and 5% glucose and water. At the same time, the infant was started on chloromycetin ®, streptomycin and gan-

trisin ®. On the following day, the infant was noted to be doing poorly and was digitalized because of congestive heart failure. The infant was noted to be very weak, listless, and had a poor sucking reflex. Somewhat later, during an attempted oral feeding of glucose water, the infant expired.

The spinal fluid culture grew a pleomorphic, Gram positive rod which agglutinated with known anti-listeria serum, and was identified by the hospital laboratory as *Listeria monocytogenes*. This identification was confirmed by the State laboratory. A post-mortem culture taken from the heart blood grew the same organism. At autopsy, a great amount of greenish-yellow, thick, purulent material was found in the subarachnoid area of the meninges. This was also present throughout the ventricular system and the base of the brain. No hemorrhage was noted. Culture of the purulent matter was taken and grew the same organism as the spinal fluid and blood cultures. The remainder of the post-mortem examination was not remarkable. Final diagnosis was purulent meningoencephalitis with focal microscopic abcesses of the adrenals, pulmonary edema, emphysema, and atelectasis.

CASE NO. 2

A twelve day old negro male infant was admitted to the hospital with a four day history of lethargy and loss of appetite. The birth history was unremarkable; the birth weight 6 pounds, 4 ounces. The infant did well for the first eight days on a standard evaporated milk formula. The parents became concerned when the infant failed to take his feedings well and brought him to the hospital. The father and three siblings were well; however, the mother had had an appendectomy on the 6th post-partum day.

Physical examination revealed a dehydrated, semi-comatose, negro, male infant, who weighed 4 pounds, 15 ounces. The fontanelles were not palpable and the cranial sutures noted to be over-riding. No signs of meningeal irritation were elicited. Regular shallow respirations were present, and the lung fields were clear. The muscle tone was poor. The remainder of the examination was within normal limits. A lumbar puncture revealed a yellow, turbid, spinal fluid under increased pressure. The white cell count was 15,800. A urinalysis was within normal limits. The peripheral red blood count was 5,300,000, the white blood count was 4,750 with 22 lymphocytes, 8 segmented neutrophiles, 62 stab cells and 8 juvenile cells. The hemoglobin was 17.7 gms. The

rectal temperature was 102° F. The fontanelles were again checked, and described as very small and not bulging. The diagnostic impression was purulent meningitis and septicemia, with moderately severe dehydration.

The child was placed in a mist tent with continuous oxygen, and immediate intravenous therapy was begun. Initial intravenous fluid consisted of equal parts of Ringer's lactate and 5% glucose in water, to which was added 600,000 units of aqueous penicillin, ACTH 40 units, hydrocortisone 40 mg., and ascorbic acid 100 mg. Concurrently, 1,200,000 units of bicillin ® intramuscular, and chloromycetin ® 50 mg. every six hours, streptomycin 0.25 gm. twice daily, and cortisone 50 mg. every six hours, were ordered intramuscularly. Cultures were made of the blood and spinal fluid prior to antibiotic therapy.

Six hours after admission, the infant had generalized convulsions, and bleeding from the mouth was noted. At this time, calcium gluconate and sulfadiazine were added to the intravenous fluid, and the convulsions were controlled by sodium amytal ®, 15 mg. every four hours intravenously. The respirations were noted to be irregular with periods of retraction and apnea. Fine, crackling rales were heard throughout the lung fields, and the condition was considered to be very poor. Twelve hours later the infant was thought to look better but the prognosis was considered very poor. Two hours later, the infant suddenly vomited bright red blood and mucous, and the respirations became irregular and ceased. Despite resuscitative measures, stimulants and oxygen, the infant expired within a few minutes.

At autopsy, large amounts of fluid blood were found in the lumen of the gastro-intestinal tract but no source of bleeding was located. When the calvarium was opened, a large amount of turbid fluid escaped, and the leptomeninges contained pools of purulent, gray-white fluid, largely over the basilar portion of the brain. Cultures of this fluid grew the same organism as the spinal fluid. The brain appeared edematous and weighed 350 gms. The final pathological diagnosis was acute, purulent leptomeningitis, severe congestion of liver, spleen and kidneys, hemorrhagic bronchopneumonia, and acute pulmonary edema.

The spinal meningeal fluid culture grew an organism tentatively identified by the hospital laboratory as diphtheroids, but definitely identified by the State laboratories as *Listeria monocytogenes*. Identification was based on biochemical reactions, and serological

agglutination tests. The blood culture remained negative after twelve days.

COMMENT

Presenting symptoms in both of the above cases were similar, but not typically suggestive of meningitis. These symptoms included lethargy, loss of appetite, and irritability. Initially, there was no evidence of bulging fontanelles, and no signs of meningeal irritation. Such signs and symptoms are often lacking in the neonatal period, and evidence suggests they may be even less when *Listeria* is the infecting organism. The peripheral white blood count was elevated in one case, and not in the other—even though the latter case showed obvious dehydration. One spinal fluid showed a high white cell count while the other was grossly bloody and did not. Both spinal fluid cultures were positive for *Listeria*: one blood culture was positive and the other remained negative.

Convulsions and gastro-intestinal bleeding were noted in the infant showing the most rapid down-hill course, and these indicate a grave prognosis. Failure in prompt diagnosis in both cases may have contributed to the fatal outcome. One hospital laboratory having previous experience with *Listeria* identified the organism promptly, the other laboratory did not. Both organisms were identified by the State laboratory. Unfortunately, there is no record of vaginal cultures from the mothers, hence the source of infection remains unknown. Some noteworthy points in these cases include:

1. Non-specific and confusing symptoms.
2. Absence of classic "meningeal signs."
3. Lack of awareness of the possible disease and the causative organism—hence delay in definitive therapy.
4. Differences as well as similarities in the clinical courses.
5. No proved source of infection.
6. Same causative organism in both cases.
7. Failure of one case to show peripheral leukocytosis.
8. Both infants were in the new-born age group.
9. Necessity of early and effective use of the lumbar puncture needle.

BACTERIOLOGY

Listeria monocytogenes is a small, aerobic, Gram positive, somewhat pleomorphic, non-spore-forming, motile bacillus.[1, 3, 5, 6] The bacteria grows readily on the common laboratory mediums usually employed. The colonies are small and round and are surrounded

by narrow zones of beta hemolysis when grown on blood agars. For more detail, the reader is referred to one of the comprehensive manuals on bacteriology, as a complete discussion of the identification methods is beyond the scope of this paper. Briefly, some of these methods include the following:

1. Carbohydrate and other biochemical reactions.
2. Anton eye test—the organism will cause a specific conjunctivitis when swabbed on the eye of a rabbit.
3. Serological tests—precipitation and agglutination studies are used and four serotypes have been described. Some disagreement exists over the value of these tests, some feeling that they may not be specific enough because cross-reactions are common.

The organism is very hardy, and can stand extremes of temperature and isolation.[9] Discrepancies are reported in the sensitivity of the organism to antibiotics.[3, 5, 9] Some report great uniformity and others wide variability in such sensitivity. The organism is commonly confused with other organisms, or called a contaminant. It is often called a *Diphtheroid, beta-Streptococcus, Erysipelothrix,* or *H. influenza.*[5, 6, 10] However, the organism is a unique species with unique characteristics.

EPIDEMIOLOGY

Listeria is widely distributed in the animal kingdom, particularly in rodents and birds. It may cause a variety of disease, and apparently the same organism may cause different diseases in different species. Animal-to-man transmission has been predicated, but evidence is not conclusive.[5, 6, 10] The same holds true for animal-to-animal transmission. No healthy carriers have been found in humans. Transmission of the disease to the human infant in utero is known and causes the clinical form of disease known as miliary granulomatosis. Transmission from the mother to the infant at time of birth is possible, as vaginal cultures of mothers of infants with listeriosis have been positive.[5, 7] Yet, other forms of human-to-human transmission are not proved. What seems more likely, is a dissemination of the infection from a common source. Although it has not been proved, animal-to-man transmission should be considered as a possibility. *Listeria* has been thought to be the causative agent of infectious mononucleosis, but this has not been proved. However, the two diseases may be confused.[2, 6] Human listeriosis may be subclinical. Human agglutina-

tion titres fade rapidly after infection, causing more difficulty in diagnosis.[5, 6] The epidemiology to date remains complex and obscure. As Murray aptly points out, the organism displays "a cryptic persistence and a peculiar host-parasite relationship."[9]

DISCUSSION

Listeria meningitis in infancy may be the only manifestation of infection, or it may be secondary to miliary granulomatosis or other generalized infections. Source of infection may be the mother, but other sources should be considered. Meningitis is not the only form of human listeriosis, but it is the most common form and the subject of this paper.[6, 8]

Many bacterial infections are difficult to diagnose in infancy. Purulent meningitis may be particularly difficult to diagnose because of insidious onset and paucity of symptoms. Failure of early diagnosis may explain the high mortality rate from meningitis, especially in the new-born period.[11] Listeria meningitis may be even more insidious and its mode of onset has been likened to tuberculous meningitis.[8, 9]

In general, any infant which fails to thrive, especially in the neonatal period, should be suspected of a bacterial infection. Once this is suspected, the only way to rule out meningitis is by adequate and early use of the lumbar puncture needle and continued close observation.

Traditional signs such as fever, peripheral leukocytosis, bulging fontanelles, and signs of meningeal irritation are more frequently absent than present. More often, the presenting complaints include lethargy, irritability, loss of appetite, unstable temperature, diarrhea, vomiting, cyanosis, dyspnea, or convulsions.[11] Blood and spinal fluid should immediately be cultured, even if there are no cells in the spinal fluid and no peripheral leukocytosis.[10] Subdural taps may occasionally be helpful, especially if the spinal fluid is grossly bloody, or a block of the spinal fluid pathways is suspected. If either of the cultures is positive, antibiotic sensitivity tests should be run as soon as possible.

Once bacterial invasion is suspected, and the specimens for culture are collected, antibiotic and supportive therapy should begin. Until sensitivity studies are completed, the infant should be treated as an unknown bacterial meningitis. Suggested antibiotics include erythromycin, crystalline and aqueous procaine penicillin, sulfadiazine, streptomycin, and chloramphenicol. The tetracyclines

have been reported to be effective and should be considered. Penicillin and erythromycin have been considered as the combination of choice in listeriosis, but this idea has not been unanimous, and sole reliance on this regimen is not advised.[3, 4, 5, 6, 10] Penicillin in high doses should be used when possible, as it is bacteriocidal as well as bacteriostatic, and it rarely causes serious side effects. However, sensitivity tests should guide treatment as soon as available. Supportive therapy in the form of fluids, oxygen, and good nursing care are equally important.

SUMMARY AND CONCLUSIONS

Two fatal cases of listeria meningitis in the neonatal period are reported. Noteworthy points are discussed. The bacteriology and epidemiology of *Listeria monocytogenes* are discussed. Listeria meningitis in infancy is discussed with reference to diagnosis and general treatment.

From these two cases and others reported in the literature, we may conclude:

1. Human listeriosis is not rare, and increasing numbers of cases are being reported; 2. Meningitis is the most common clinical form and is an important pediatric disease; 3. The epidemiology is obscure, but *in utero* infection is authenticated, and infection at the time of birth is possible; 4. An awareness of the disease enhances recognition; 5. The bacteria is readily identifiable, but may be confused wth other organisms; 6. Classic signs of meningitis may be minimal or absent; 7. Prompt collection of blood and spinal fluid specimens are mandatory; 8. Antibiotics and chemotherapy are effective, but the sensitivity of the organism may vary from case to case; 9. Antibiotic sensitivity studies should be made, and until completed, immediate therapy for an unknown meningitis is advised; 10. Consistently, the most potent antibiotics seem to be penicillin in large doses, the tetracyclines, and erythromycin; 11. Antibiotic treatment should be individualized as soon as possible, and supportive treatment is equally important.

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AMYOPLASIA CONGENITA

Review of Literature and Report of Three Cases

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Amyoplasia congenita is the name given by Sheldon[1] to a rare condition of which, up to 1949, only about fifty cases have been recorded in the literature.[2] The condition manifests itself as multiple congenital articular rigidity. Arthrogryposis multiplex congenita[3] is a synonym of the condition, but inasmuch as the ankylosis of the affected joints occurs usually in extension, this term is not entirely justified because arthrogryposis should be employed for contraction of joints in flexion. Middleton[4] used the term "myodystrophia faetalis deformans," as being more accurately descriptive of its probable pathogenesis.

Etiology: The disease has its onset during intra-uterine life, but is neither heriditary nor familial. Some authorities ascribe the condition to an abnormality of the intra-uterine environment, namely, prolonged intra-uterine pressure, as these cases have been frequently associated with both hydrammios and oligamnios. However, this explanation gives little weight to the lesions found in the spinal cord and meninges to be described later. Further, the frequent association with other malformations such as defects of the vertebrae absence of the sacrum and cleft palate, indicates that the syndrome originates early in embryonic life before intra-uterine pressure becomes a factor.

Pathology: 1. Post mortem studies have indicated that the joint symptoms and the articular fibrotic changes are secondary to changes existing in the muscles. According to Sheldon[1], the fibrous ankylosis is associated with great diminution in the size of those very muscles which would normally be concerned in producing the movements which the child is unable to perform. For example, if the elbow is fixed in extension, the triceps will be found well developed but the biceps is only a shadow of itself. Caffey[5], however, states that there is a generalized fetal failure of muscular development and growth starting in utero and that the deformities and

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joint ankylosis are secondary to the shortness of the defective muscle groups. Apparently, the muscular defect is not of the nature of true aplasia but the result of an arrest of development with early degeneration of certain muscle groups. On histological examination of the affected muscles, Stopford Price[6] (1933), has described degeneration with atrophy of muscle fibers and some fibrosis and fat replacement.

2. The cord exhibits some degenerative changes in the cells of both anterior and posterior horns at the cervical and lumbar enlargments, together with some thickening and increased vascularity of the meninges, but whether these findings are sufficient to account for the histologic and functional changes in the muscles affected remains an open question.

The main clinical features are: (1). The condition is noticed at birth as the disease has its onset in intra-uterine life. (2). It presents a "congenital articular rigidity" of one or more joints of the limbs. This rigidity chiefly affects the elbow and knee joints, and less often or severely the shoulder, hip, wrist or ankle joints. The rigidity is usually bilaterally symmetrical and is commonly in extension. It is always without inflammatory changes. (3). There is no rigidity of the spine; its full extension and flexion is possible. (4). Clubfoot and clubhand may be associated. (5). There is evident wasting and atrophy of those muscles which normally produce the movements which the child is unable to perform. Meanwhile, there is no hypertonia or hypertrophy of antagonistic muscles, showing that the immobility is not attributable to muscular over-action. This is further proved by the fact that the mobility is not increased under general anesthesia. (6). The overlying skin may be tense and shiny, but shows no sensory or trophic changes. (7). The response of the affected groups of muscles to electrical stimulation is diminished. There is weak or absent faradic or galvanic response but no reaction of degeneration. (8). Roentgenograms show no abnormality in the bones except possibly some atrophy from disuse. (9). Intelligence is not affected, but the face may, however, have a dull or even masklike expression.

Prognosis and Treatment: Treatment is very unsatisfactory.

1. A slight amount of movement may come about after years of passive manipulations.

2. Partial correction of the deformities may be gradually achieved

by the use of splints, plaster casts and orthopedic surgery, but little change in muscle power can be attained through this line of treatment.

3. According to Chapple,[7] treatment with large doses of estrogenic substances has in some cases shown some promise in decreasing the stiffness of the joints.

CASE REPORTS

Case 1: F. K., female, aged 8 months, was admitted to Abbassia Children's Hospital on May 4, 1957 with the complaint of deformity of both feet and stiffness of the limbs. These abnormalities were noticed at birth.

Family History: The parents were unrelated and both were middle-aged, in good health, and of normal intelligence. The patient was the last of eight pregnancies of which two older brothers and two older sisters were living and in good health, while the other three brothers had died, but not one of them showed a similar abnormality.
Gestation and Birth History: During gestation the mother enjoyed good health. She had experienced no severe shocks, falls or accidents of any kind, nor had she been irradiated by x-ray or radium. The child was born at full term, the amount of amniotic fluid was apparently normal and there was no premature rupture of the membranes. However, the patient was cyanotic at birth, and this was attributed to two constricting bands which were found in the umbilical cord, one near its placental attachment and the other near its umbilical insertion.

Present History: The deformity of the feet and the stiffness of the knees and elbows were noticed at birth. When the child was about one month old, his mother took him to the Children's Hospital at Mounira where correction of the feet deformity was tried by five consecutive plasters with some improvement. However, the articular rigidity was stationary since birth.
Examination: The child looked alert and was apparently of normal mentality. She was underweight (6.7 kilograms and the normal is about 8½ kg.); was of a normal height (63 cm.) and had a normal circumferance of the skull (41 cm.). Her temperature was 37.0° C; pulse, 120/min. and respiration 30/min.

The skull showed normal dimensions and was free from any rachitic manifestations. The chest and the spine showed no deformities and the spine had a normal range of movement. The

lungs and the heart were clinically free. In the abdomen, the liver was two fingers below the costal margin but the spleen was not palpable.

A—*Deformities:*

I. In the upper limbs, the elbows were fixed in semi-flexion. Both wrists were also fixed in slight flexion while the metacarpophalangeal and interphalangeal joints were almost completely extended, and the fingers were thin, abnormally long and tapering. (Fig. 1).

II. In the lower limbs, there was a flexion and adduction deformity of both hips; the thighs were fixed in slight flexion and a marked adduction. There was also left genuvalgum with internal rotation of the left leg at the knee and there was bilateral talipes equinovarus of both feet. (Fig.2).

FIG. 1

B — *Limitation of Motion:*

I. *In the upper limbs:*

(a). *At the shoulder joints*

	Extension to	Flexion to	Total range of movements
Right and left sides with scapulae fixed	100°	0°	100°
Right and left sides with mobile scapulae	120°	0°	120°
(b). *At the elbow joints*			
Left (active and passive)	180°	120°	60°
Right (active and passive)	180°	60°	120°
(c). *At the wrist joints*			
Right (active and passive)	180°	110°	70°
Left (active and passive)	140°	100°	30°

(d). *At radio-ulner joints:* On both sides, pronation was free but supination was partially limited.

(e). *Fingers:* Some stiffness at the metacarpophalangeal and interphalangeal joints. The patient could not close his fist neither by active nor by passive movements.

II. *In the lower limbs:*

(a). *At the hip joints:* On both sides, flexion was allowable to 110°. Extension was possible with compensatory lordosis. External rotation of the left hip was limited. Adduction was also markedly limited.

FIG. 2

(b). *At the knee joints:*

		Extension to	Flexion to	Total range of movements
1.	Right (active and passive)	180°	110°	70°
	Left (active and passive)	180°	170°	10°

2. An abnormal sideway mobility at both knee joints was possible especially on the right side.

C — *Ankle Joints:* Practically, no movements could be elicited.

The Muscular System: There was marked wasting of the muscles of the limbs, especially over the ventral surfaces of the arms and thighs. Muscles of the trunk were apparently normal.

Investigations: (1). The blood picture revealed a moderate degree of anemia with Hb. 60%, R.B.C. 3,500,000, W.B.C. 12,000 with 60% polymorphonuclear, 34% lymphcytes, 2% monocytes, 4% eosinophils and 0% basophils, S.R. 15, blood calcium 9.5 mg.%, alkaline phosphatase 6.5 B.U., blood phosphorous 5 mg.%—B.U., that is, all within normal. Wassermann for the child and the mother was repeatedly negative.

Investigations: Hb. 78%, R.B.C. 4,200,000, W.B.C. 8,000 with 58% polymorphonuclear, 38% lymphcytes, 2% monocytes, 2% eosinophils and 0% basophils, S.R. was 5, blood calcium 9.2mg.%, phosphorous 4.0%, alkaline phosphates 5.6 B.U.; urine and stools normal.

(2). Urine and stools showed no abnormality.

(3). X-ray picture showed no abnormality in the bones of the skull, spine, long bones, hip or knee joints. Both feet were deformed with sublaxation of the ankle joints.

(4). Electrical stimulation induced a good response of both muscles and nerves of both upper and lower limbs to the galvanic current, but no response to the faradic current.

(5). Muscle biopsy from the left brachialis muscle showed (i) degeneration with atrophy of muscle fibres, (ii) some replacement with fibrous and fatty tissue, (iii) absence of any inflammatory cellular infiltration (Fig. 3). A muscle biopsy from the rectus muscle, however, showed a completely normal histology.

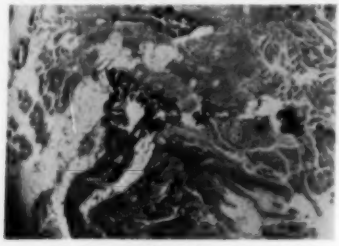

FIG. 3

Treatment and Progress: The patient was treated with massage and passive movements and the orthopedic surgeon tried gradual correction of the deformities with repeated plaster casts. After six months of treatment, neither the muscle power nor the deformities showed any appreciable improvement.

Case 2: Kh. A.Z., male, nine years age. He is a Palestinian, and was admitted to Abbassia Children's Hospital on November 5, 1957, with the complaint of (1) deformity of both upper and lower limbs, (2) inability to stand and to walk. The condition dates from birth.

Neither family history, nor the gestation and birth histories were available as the child has no relatives in Cairo.

On examination the child's mentality seemed normal. The skull circumferance was normal (20.5 inches). However, the child was very much underweight (17 kg.) and his height was much below normal being 105 cm. instead of approximately 122 cm. to 127 cm. The upper half of the body was 61 cm. and the lower half 44 cm. The right lower limb was 47 cm. and the left lower limb was 43 cm.

The patient was able to sit (Fig. 4) and in this position his elbows

were kept fixed in semiflexion, his hands clubbed, the spine somewhat curved, the knees semiflexed and the right leg internally rotated, and both feet clubbed. The chest, heart and abdomen were all free.

Examination of the Extremities Revealed the Following:

A — *Deformities:* (Fig. 4)

1. In the upper limbs, the elbows were semiflexed, both wrists were in flexion and flexion was more marked on the left side; there was ulnar deviation of both hands, more marked on the right side, the metacarpophalangeal joints were extended and the fingers were thin, abnormally long and tapering.

2. In the lower limbs, there was apparent supratrochanteric shortening on the left side which amounted to 4 cm. The base of the left Bryant's triangle was shorter than the right, indicating dislocation of the left limb. There was a flexion deformity of both hips with compensatory lordosis. There was right genuvalgum with internal rotation of the right leg at the knee and there was bilateral talipes equinovarus of both feet.

3. The spine showed a slight scoliotic deformity at the dorsolumbar regions besides the compensatory lordosis mentioned before.

B — *Limitation of Motion:* I. *In the upper limbs:*

	Extension to	Flexion to	Total range of movement
(a). At the shoulder joints			
On both sides, with fixed scapulae	90°	0°	90°
On both sides, with mobile scapulae	180°	0°	780°
(b). At the elbow joints			
On both sides (active and passive)	170°	10°	160°
(c). At the wrist joints			
Right active	200°	90°	110°
Right passive	260°	80°	180°
Left active	90°	80°	10°
Left passive	160°	60°	100°

(d). At radio-ulnar joints: Supination and pronation are free on both sides.

(e). Fingers: Some rigidity at the metacarpophalangeal joints as well as the interphalangeal joints. The patient could not, therefore, close his fists, even when aided.

II. *In the lower limbs:*

(a). *At the hip joints*

Right (active) flexion allowable to	140°
Right (passive) flexion allowable to	170°
Left (active) flexion allowable to	100°
Left (passive) flexion allowable to	130°

Extension possible with compensatory lordosis. External rotation of right hip was limited.

(b). *At the knee joints*

	Extension to	Flexion to	Total range of movement
Right (active)	120°	95°	35°
Right (passive)	180°	90°	90°
Left (active)	150°	90°	60°
Left (passive)	160°	85°	75°

There was normal sideway mobility at both knee joints especially on the left side.

(c). *At the ankle joints:* There was hardly any movement neither active nor passive.

III. *The spine* had free mobility.

The Muscular System: There was marked wasting of all the muscles of the limbs, muscles of the trunk were less markedly affected.

FIG. 4

FIG. 5

X-ray picture showed (1) the left femoral hip is smaller and rarefied and is dislocated upwards; (2) the left acetabulum is irregular and rarefied; (3) the left iliac bone shows a corresponding area of osteoporosis opposite the femoral head, and (4) there was severe bone decalcification and osteoporosis of carpal and tarsal bones with disorganised joints and fibrous ankylosis in semiflexed positions.

Muscle biopsy from the flaxors of the knee showed (1) degeneration with atrophy of muscle fibres; (2) replacement with fibro-fatty tissue; (3) absence of inflammatory cellular infiltration. Elec-

trical reaction of the affected muscles of the limbs showed weak response to both faradic and galvanic currents.

Treatment: Several orthopedic operations were performed on this patient for the correction of the deformities of his limbs. These operations included tenotomy of semi-tendenosis, lengthening of right tendoachilis, right Macewan's osteotomy, Ober's operation and many others. They resulted in some improvement of the deformities, but the patient remained a crippled invalid.

Case 3: Sh. G., male, two months of age, was brought to Abbassia Children's Hospital on May 4, 1958 with the complaint of deformity of both lower limbs dating from birth.

Family History: The patient is the second child in the family; the first is a boy of two and a half years of age, and is normal in all respects. The father is about 40 years of age and is in good health. The mother is about 30 years old and is also in good health. Neither in the family of the father, nor in the family of the mother had a similar condition been observed.

Gestation and Birth History: During gestation, the mother enjoyed good health. She had experienced no severe shocks, falls or accidents of any kind, nor had she been irradiated. Between the second and third months of pregnancy, however, she was given two injections of DIPRO (progesterone combined with estradiol) on two consecutive days, but apparently these induced no ill-effects upon her general health.

The child was born at full term with normal amount of amniotic fluid. At birth, he was neither cyanotic nor jaundiced but showed a marked deformity of both lower limbs.

Examination: The child appeared to enjoy a normal mentality. His weight was normal, (about 5 kg.) and the circumferance of the skull (14") was also normal. Owing to the deformity in the lower limbs, his length was below normal, being 20 inches instead of approximately 22 inches. The chest, spine and upper limbs were all normal. The lungs and heart were clinically free. The abdomen looked normal and neither the liver nor the spleen were enlarged. Besides the congenital deformity in the lower limbs, the child was also suffering from a marked congenital laryngeal stridor.

Examination of the lower limbs revealed severe deformity, which involved all hip, knee and ankle joints and was more or less symetrical on both sides.

A. — *Deformity:*

I. Both hip joints showed a flexion deformity with compensa-

tory lordosis. (Fig. 5). The thighs were also fixed in marked adduction and some external rotation.

II. There was genuvalgum with marked sublaxation of both knee joints and marked lateral displacement of both legs.

III. There was also bilateral marked talipes equinovarus.

B. — *Limitation of Motion:*

I. At the hip joints on either side, there was: (i) an allowance of about only 10° of adduction; (ii) an allowance of flexion to about 120°; (iii) full extension possible by compensatory lordosis.

II. *At the knee joints:*

	Extension to	Flexion to	Total range of movement
(a). On both sides (active)	180°	180°	0°
On both sides (passive)	200°	180°	20°

(b). Abnormal sideway mobility at both knee joints.

III. At the ankle joints practically no movements could be performed.

IV. In the upper limbs and the spine mobility was free.

Investigations: The blood picture reveaied the following: Hb. 90%, R.B.C. 4,500,000, W.B.C. 15,000 with 60% lymphocytes, 35% polymorphonuclears, 3% monocytes, 2% eosinophils and 0% basophils. The mean sedimentation rate 5, blood calcium 10 mg.%, blood phosphorous 5 mg.%, alkaline phosphatase 7.5 B.U., that is, all within normal; Wassermann for the child and the mother was negative; urine and stools showed no abnormality; x-rays of the bones and the joints of the skull, upper limbs, spine and the chest were all normal. X-ray picture for the lower limbs showed:

(1) The bones of the thighs and the legs show sublaxation of both knee joints; (2) big soft tissue shadows of thighs and legs; (3) shafts of tibiae, fibulae and femora show no bony changes; (4) both feet are deformed with sublaxation of ankle joints; (5) metatarsal bones show no bony changes; (6) large soft tissue swelling is seen on both knees and ankle regions.

Treatment: It was decided to start correction of the talipes on the spot, and to postpone other orthopedic operations for correction of other deformities until the child is more than one year of age.

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EDWARD JENNER

(1749 - 1823)

"Some of the most important contributions to pediatrics were made during the seventeenth and eighteenth centuries. Above all, the eighteenth century is preeminent for the discovery of vaccination—the epoch-making contribution made by Jenner to medicine in general and to pediatrics in particular." *

EDWARD JENNER not only saved thousands of adults and children from the scourge of smallpox through his discovery of smallpox vaccination, but opened up an entirely new field of study—immunology. Jenner announced his belief in the effectiveness of the cowpox as an immunizing agent after years of observation of the immunity developed by dairy maids and servants who had been infected with cowpox. In May, 1796, he transferred cowpox from the hand of a young woman who was infected with cowpox, into the arm of an eight-year-old boy. Six weeks later he introduced smallpox matter into the boy's arm, but the boy did not develop the disease.

Jenner describes his daring and crucial experiment as follows:

"The more accurately to observe the progress of the infection, I selected a healthy boy, about eight years old, for the purpose of inoculation for the Cow Pox. The matter was taken from a sore on the hand of a dairymaid, who was infected by her master's cows, and it was inserted, on the 14th of May, 1796, into the arm of the boy by means of two superficial incisions, barely penetrating the cutis, each about half an inch long.

"On the seventh day he complained of uneasiness in the axilla, and on the ninth he became a little chilly, lost his appetite, and had a slight headache. During the whole of this day he was perceptibly indisposed, and spent the night with some degree of restlessness, but on the day following he was perfectly well.

"The appearance of the incisions in their progress to a state of maturation were much the same as when produced in a similar manner by variolous matter. The only difference which I perceived was, in the state of the limpid fluid aricing from the action of the virus, which assumed rather a darker hue, and in that of the efflorescence spreading round the incisions, which had more of an erysipelatous look than we commonly perceive when variolous matter has been made use of in the same manner; but the whole died away (leaving on the inoculated parts scabs and subsequent eschars) without giving me or my patient the least trouble.

* *"Pioneers of Pediatrics", Copyright 1943—by Abraham Levinson, M.D.*

An Inquiry into the natural
History of a Disease known in
Glostershire ~~under~~ by the name
of the Cow-pox

The deviations of Man from the state
in which he was originally plac'd by Nature
seem to have proved to him a prolific
source of Diseases. From the love of
splendor, from the indulgences of Luxury, &
from his fondness for amusement, he has
familiariz'd himself with a great number
of animals ~~which~~ which may not originally have
been intended for his associates. The Wolf,
disarm'd of ~~his~~ ferocity, is now pillow'd in
the Lady's lap*. The Cat, the little Tyger of

* The late Mr John Hunter proved by experiments
that the Dog is the Wolf in a degenerated state.

FIRST PAGE OF JENNER'S MANUSCRIPT

An Inquiry into the natural History of a Disease known in Glostershire by the name of the Cow-pox. This is from the original manuscript (Wellcome Historical Medical Museum); upon publication (London, 1798), the title was changed.

"In order to ascertain whether the boy, after feeling so slight an affection of the system from the Cow-Pox virus, was secure from the contagion of the Small-Pox, he was inoculated on the 1st of July following with variolous matter, immediately taken from a pustule. Several slight punctures and incisions were made on both his arms, and the matter was carefully inserted, but no disease followed. The same appearances were observable on the arms as we commonly see when a patient has had variolous matter applied, after having either the Cow-Pox or the Small-Pox. Several months afterwards, he was again inoculated with variolous matter, but no sensible effect was produced on the constitution."

Jenner's "Inquiry into the Cause and Effects of the Variolae Vaccinae, published in 1798, is a classic. Its style is lucid, its illustrations illuminating and its case histories highly interesting. Jenner's account of the difficulties he encountered in doing research work adds a very human touch:

"They who are not in the habit of conducting experiments may not be aware of the coincidence of circumstances necessary for their being managed so as to prove perfectly decisive; nor how often men engaged in professional pursuits are liable to interruptions which disappoint them almost at the instant of their being accomplished. . . . The spring of the year 1797, which I intended particularly to have devoted to the completion of this investigation, proved, from its dryness, remarkably adverse to my wishes; for it frequently happens, while the farmer's horses are exposed to the cold rains which fall at that season that their heels become diseased, and no Cow-Pox then appeared in the neighbourhood."

CLINICAL STUDY OF THE USE OF A NEW CERUMENOLYTIC AGENT IN CHILDREN

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Excessive deposits of cerumen may have serious consequences such as impaired hearing, itching, pain and vertigo.[1, 2] Cerumen has been shown to be an effective medium for the breeding of pathogenic organisms.[3] If allowed to remain in the ear, a dessicated mass may form containing desquamated cells along with a variety of external debris which can irritate the external auditory canal to the point where pathogenic organisms easily invade the tissues.[4]

The problem of excessive cerumen presents itself time and again in pediatric examinations, often involving situations where a hard, dessicated plaque can be removed only by instrumentation after the cerumen has been suitably softened. However, cerumen impacted for a long period of time, frequently becomes adherent to the epithelium of the ear canal,[5] and its removal can be a painful and traumatic process.[6]

Although quick and efficient pharmacologic cerumenolysis is the method of choice, the available pharmaceutical preparations (olive oil, sodium bi-carbonate, glycerine, ethyl alcohol, hydrogen peroxide, saline, etc.) are either not significantly effective, or cause pain and irritating skin reactions.[7-9]

The purpose of this paper is to describe a new, and recently available cerumenolytic agent, Cerumenex,* which was found[10] to be a safe and effective means for removing ear wax in the adult, prompted our study of its application to pediatric practice. This new solution consists of a unique protein polypeptide surface active agent in a hygroscopic vehicle. It has been shown[11] that no histopathologic changes occur after the instillation of Cerumenex into the ears of rabbits with both intact and perforated tympanic membranes. The sensitive rabbit-eye irritation test[12] similarly indicated a lack of irritation by this agent.[13]

*Cerumenex is a triethanolamine polypeptide oleate-condensate in propylene glycol preserved with chlorobutanol, supplied through the courtesy of S. J. London, M.D., Medical Director, The Purdue Frederick Company, New York City.

*Adjunct Pediatrician, Bronx Hospital, New York.

The pH of this solution is slightly acid, thereby serving to maintain the normal pH of the auditory canal, and its low vapor tension eliminates the possibility of pressures arising in occluded pockets. The solution is completely miscible with water and serous fluids and can be easily removed by simple irrigation. The presence of an antiseptic agent, chlorobutanol, is especially desirable since it minimizes local tissue infection as well as cross contamination during the use of this product.

METHODS AND MATERIALS

Seventy-five children of both sexes, ranging in age from four months to fifteen years, were selected for study. All of the children had excessive ceruminous deposits in their ears which required removal. In forty-six patients, the cerumen was of a dessicated and hard consistency, completely obscuring the tympanum. In eight of the group, while the tympanum was not obscured, the excess cerumen was of the hard, dry and encrusted type. In the remaining twenty-one patients, the cerumen was of a soft character, but considered to be excessive. Other than excessive cerumen, there was no other aural pathology. The following experimental procedure was used: One ear was filled with the cerumenolytic agent and plugged with cotton. After a waiting period of approximately one-half hour, both ears were gently irrigated with warm water, utilizing a "B-D Asepto ear syringe." The syringe was gently moved about during the irrigation, in order to provide a small amount of mechanical agitation. Both ears were then examined with the aid of an otoscope and the degree of cerumenolysis evaluated. It was soon found that water irrigation had no effect on the impacted cerumen and the procedure was changed to include both ears.

Since the prevailing practice is to prescribe an agent intended to soften the wax to be instilled twenty-four hours before the office visit, the scope of this new drug was also investigated under these conditions. For this phase of the study, the mothers were given the solution and were instructed to instill the drug into the ears the night before the office visit. The ear canal was to be filled with this solution and then plugged with cotton. At the office visit, the ears were gently irrigated in the manner described above.

The results were evaluated as follows: An *excellent* response was considered to be one in which the excessive cerumen had been removed; a *good* response was one in which partial cerumenolysis

was achieved and a poor response was one where little or no effect on the cerumen was observed. If any local tissue injury was observed, the effect was graded as "poor." The results are described in Table I.

TABLE I

THE CLINICAL EFFECTS OF CERUMENEX

				RESULTS			
Group	Type and Degree of Cerumen	No. of Patients	Age Range	Excellent	Good	Poor	Comments
I	Hard, dry, tympanum obscured.	46	13 mos.-12 yrs.	40	6	0	Six patients required two to three repeat office treatments. The single overnight application was effective in all other cases.
II	Hard, dry, tympanum not obscured.	8	4 mos.-15 yrs.	8	0	0	All treated by overnight technique.
III	Soft, excess cerumen.	21	2 yrs.-9 yrs.	21	0	0	

RESULTS

Cerumenex, the new cerumenolytic drug, was found to be very good and effective for the removal of ear wax in children. In more than ninety per cent of the over-all group, the response was excellent, while in the remainder a good response was observed. It is of interest to note that while complete removal of the ear wax was achieved by pretreatment instillation of the solution, the short exposure to the agent during the office treatment did not completely remove the wax in fifteen per cent of the group. When the treatment was repeated with this latter group, however, an excellent result was achieved. Thus, complete cerumenolysis may be achieved by adequate exposure of the ceruminous plaque to Cerumenex. Since this will vary with the quantity and character of the cerumen encountered, the preferred technique would be to instill the agent sometime prior to the office visit.

There were no local tissue responses observed in spite of the fact that repeated use in the same patient was conducted over a period of from six to eight months. Approximately thirty of the group received at least twelve applications during an eight month period. In this group, there was no evidence of local irritation, sensitivity or any adverse responses.

DISCUSSION

One of the most annoying aspects of the problem of excessive ear wax is the patient's own attempt to remove the wax. Children especially, when their ears "itch" or "burn," will poke and pry with any device available. There are many cases where hairpins, matchsticks or even paper clips have caused a furunculosis of the external auditory meatus. The tissues of the ear are easy to damage, and the tympanum may be ruptured by an injudicious attempt to clean the canal.

The instillation of Cerumenex for routine aural hygiene of the infant is also suggested. Because of the antibacterial properties of this agent[14] and its lack of sensitizing properties,[15] it may be used as often as is necessary. The all too common practice of "poking" into the infant's ear may be avoided and optimal aural hygiene assured.

Many pediatricians omit otoscopic examination of the inner ear during the immediate post-natal period since there is usually obstruction from amniotic debris. It may be considered good practice to examine the inner ear as soon as feasible and the removal of meconium and vernix caseosa can be readily accomplished with Cerumenex. A few drops instilled into each ear will soften and facilitate the expulsion of this foreign matter, often without syringing, conveniently permitting examination of the ear of the infant.

Livingston[16] in referring to those conditions which produce conductive deafness, says "Impacted cerumen . . . is by far the commonest cause." This is not surprising when we consider that 22.0 per cent of normal ears, and in 30.7 per cent of ears with definite pathology the tympanic membrane is totally obscured by cerumen.[17] However, in spite of the therapeutic and prophylactic importance of removing cerumen, a minimum of pharmacologic research has until recently been done on the problem of cerumenolysis.

The best of the recommended agents for removing ear wax are disappointingly inadequate, and mechanical removal, without a cerumenolytic agent, is a hazardous procedure. An effective, safe

and painless cerumenolytic agent, such as Cerumenex, is, therefore, a welcome addition to pediatric medicine. The procedure is simple to carry out and does not cause any disturbance to the patient.

SUMMARY

A clinical study of the cerumenolytic properties of Cerumenex in seventy-five children established this agent to be a safe and effective agent for the removal of ear wax. This preparation avoids the local tissue trauma of the older manipulative techniques and causes no pain or disturbance to the patient. Its use for routine aural hygiene of the infant and child is recommended.

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NEOMYCIN TOXICITY: A CASE REPORT

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Recent investigations,[1] demonstrate the neurotoxcity of intraperitoneal neomycin sulfate, by its neuromuscular blocking effect. It has also been shown, that this effect is enhanced by ether inhalation anesthesia. Case reports in current literature,[2-6] confirm the findings of respiratory depression after intraperitoneal neomycin sulfate administration. Reportedly,[6] this is more common in infants and young children. The probable factor is the toxic reflex action on the peritoneal visceral surfaces, causing neurogenic suppression of cerebral circulation, anoxia, and reflex lowering of the systemic blood pressure, with resulting respiratory hypoxia and depression. It is a well known fact, that certain neuro-vascular reflexes are sensitized during anesthesia with various agents. The following is reported for further review of this problem.

A six year old white male child was admitted to a local hospital emergency room with a penetrating wound of the abdomen. A sixteen-inch wooden stick was lodged in the lower left quadrant. It penetrated obliquely, passing into the pelvis at a fifty-degree angle. The foreign object was removed. Exploratory laparotomy revealed several abrasions and laceration of the mesenteric border of the ileum. A mid-jejunal deverticulum was an incidental finding. The mesenteric laceration was repaired and routine abdominal closure was carried out. The postoperative course was uncomplicated.

During the course of the procedure 5 gms. of neomycin sulfate, in approximately 250 cc normal saline was used for irrigation of the peritoneal cavity. As the fascia was closed, a gradual decrease in the respiratory rate was noted by the anesthestist. After skin closure, the rate fell to eight per minute, pupil reacted slowly, with bilateral dilation, and an increase in pulse rate to 110-140 per minute. The patient remained on positive pressure oxygen for approximately one hour, forty-five minutes. No further drugs or inhalation agent was administered. The respiration rate increased to fourteen per minute, the pupils reacted, the pulse rate fell to 90-106, and the patient was moved to the recovery room.

No untoward effect was noted during the post-operative period, and the patient was discharged in excellent condition.

SUMMARY

A case of respiratory depression following peritoneal lavage with neomycin sulfate is reported. The value of abdominal cavity irrigation with a drug of neurotoxic properties is questioned.

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BERNREITER, M.: MYOCARDIAL INFARCTION IN AN INFANT WITH TRANSPOSITION OF THE GREAT VESSELS. (Journal American Medical Association, 167:459, May 24, 1958).

An unusual case of myocardial infarction occurred in an infant 7 weeks old with transposition of the great vessels. Serial electrocardiograms were taken from the time of birth to the time of death. The congenital cardiac anomaly and the myocardial infarction were verified at autopsy. Complete transposition of the large vessels with the coronary arteries arising from the transposed aorta supplying mostly venous blood to the myocardium was the basic congenital anomaly in this case. Myocardial infarction in infants has been described by others, but always on the basis of congenital anomaly of the coronary vessels. This case, as far as could be determined, is the first in which myocardial infarction resulted as a direct result of transposition of the great vessels with the coronary arteries originating in the transposed aorta. The diagnosis of myocardial infarction was clearly established before death by the electrocardiogram. AUTHOR'S SUMMARY

Current Literature

By

Michael A. Brescia, M.D.

Psychoendocrinology. Neuroendocrine Research Unit with Twenty-three Contributors. Edited by Max Reiss, M.D., D.Sc. Cloth. Pp. 203. Price $7.00. New York: Grune and Stratton, Inc., 1958.

The editor and his twenty-three contributors are to be congratulated on presenting psychiatry from an endocrinological standpoint, a complex and fascinating problem yet a decided progressive step in solving mental disease. The symposium represents the first attempt to combine the views and results of clinicians and research workers concerned with the psycho-neuro-endocrine interrelation. The book brings us to the realization and appreciation of the influence of endocrine function in psychiatry. Dr. Reiss and his co-contributors discard the two dimensional explanation in psychciatry, cause and effect, and he presents the problem of mental disease with treatment from a psychoendocrine concept, wherein the ductless glands play an important physiological role in the blood and tissue cells to maintain a normal constancy in chemical patterns. The endocrine function, the hormone equilibrium and the width of adaptability, determines when an existing emergency situation will lead to the precipitation of psychopathological phenomena in an individual of a certain personality pattern.

The importance of not only the physical examination in psychiatry but also the B.M.R. and I 131 tracer test and 17-ketosteroid excretion rates are factors in deciding the treatment and prognosis in psychopathologic states, with particular reference to the hormone equilibrium of the body. It behooves the psychiatrist, the internist, the general practitioner and even the pediatrician to search into the psychoendocrine interrelation at this time and tackle the psychoneuroses and psychoses from a different viewpoint. In addition to electroplexy, insulin therapy and pharmacotherapy, we now have endocrinology in the armamentarium of therapy. The experimental data and case presentations are of great interest and value to the reader.

This reviewer heartily recommends the book to all doctors practicing medicine and psychiatry in the office and in the hospital.

Joseph M. Covelli, M.D.

PRACTICAL ALLERGY. Edited by M. Coleman Harris, M.D., F.A.C.P. and Norman Shure, M.D., F.A.C.P. Cloth. Pp. 435. Philadelphia, Pa.: F. A. Davis Co., 1957.

The authors are distinguished allergists with broad experience, teachers, whose abilities are recognized in California.

This textbook was designed primarily for use by medical students. It is sufficiently detailed and current to serve as an excellent reference work for the general practitioner, and its systematic organization should make it of interest to all physicians. A major portion of allergy practice currently is in the hands of the general practitioner and of the specialist whose practice is not limited to allergy and who does not devote much of his time to this important and increasing phase of medical practice.

This book is a modern and authoritative guide on diseases of allergenic origin. The writers cover allergy as a possible etiologic factor in all fields of medicine. Careful study of the individual patient is stressed. They clarify and simplify the important subjects of skin testing, the studies concerning foods, pollens, drugs; bacterial, physical and insect allergy; desensitization and all the modern aids for diagnosis and treatment of diseases of allergenic action. The 16 valuable charts are most helpful, their concise answers summarizing volumes of vital data. The specialty of allergy is in a period of transition from treatment on a more or less empiric basis to that of an increasing awareness and understanding of the interrelationships of the hyperimmune response, the glands of internal secretion, the relation of serotonin to anaphylactic shock, and diverse factors as changes in barometric pressure and personal emotional problems. The bibliography for supplemental reading is considerable although much of the information in this book is based on personal experience.

The general practitioner should find this volume extremely useful, particularly, since techniques are described in detail and in such a clear, concise fashion. It should also prove valuable to anyone primarily interested in allergy. JOSEPH M. COVELLI, M.D.

HANDBOOK OF TREATMENT OF ACUTE POISONING. Edited by E. H. Bensley, M.D., F.A.C.P. and G. E. Joron, M.D., F.A.C.P. Cloth. Pp. 204. Price $4.00. Baltimore, Md.: Williams and Wilkins Co., 1958.

The scope of this handbook is intentionally limited. When one considers the magnitude of the subject of toxicology, that there are

about 250,000 trade-name products, then one can appreciate the practicality of this book as presented in outline form to the busy physicians and to teachers of students in medicine. This book is primarily a guide to treatment. It is impossible for the physician to be familiar with the general formulations of these numerous products, the toxicity of their ingredients and recommended therapy. This handbook fulfills two purposes. First, it helps the physician with no special experience in toxicology when called upon suddenly and unexpectedly to treat cases of acute poisoning. Second, it may be used as the basis of courses in the management of acute poisoning.

Section I of the handbook is devoted to the basic principles, general plan and methods of treatment. A thorough grasp of the contents of this section will enable the physician to treat acute poisoning without knowledge of the exact identity of the poison. Section II contains descriptions of important types of poisoning and their treatment. Most of the substances dealt with are relatively common causes of poisoning.

I heartily recommend this handbook to all busy physicians and to teachers of students in medicine. JOSEPH M. COVELLI, M.D.

INFECTIOUS DISEASES OF CHILDREN. Saul Krugman and Robert Ward. Cloth. Pp. 340. 44 Illustrations and 7 Color Plates. St. Louis, Mo.: C. V. Mosby Co. Price $10.00.

This text mirrors throughout its pages the changing picture in communicable disease. Many bacterial infections, such as diphtheria and scarlet fever which occupied the attention of the clinician twenty years ago have been brought under control and emphasis has shifted to the infectious diseases of viral origin.

The newly discovered adenoviruses and their relationship to acute respiratory disease, primary atypical pneumonia, bronchiolitis and epidemic kerato-conjunctivitis are discussed in the initial chapter and are followed by sections on the common cold, Coxsackie virus infections, viral encephalitis and other diseases of viral origin. The laboratory data so essential for the identification of many of these viral diseases are succinctly but adequately presented.

There is a lucid discussion of the problems presented in Rubella complicating pregnancy. The most recent work on Toxoplasmosis is a welcome inclusion. The bacteial and Rickettsial infections are well covered and include an entire chapter on Staphylococcal Infections, a subject at present much in the limelight.

The final two chapters round out the volume. One, a summary of the major clinical diagnostic features of communicable diseases should prove of particular value to the medical student. The other is by Dr. Morris Greenberg, Director, Bureau of Preventable Diseases, Health Department, New York City and presents an interesting and thought provoking discussion of the management of patients with communicable disease in general hospitals.

The authors have seen fit to arrange their subject matter alphabetically; thus, for example, the chapter on Diphtheria is interposed between Coxsackie Virus Infections and Encephalitis (Viral). Some other arrangement of material, such as one based on etiology, e.g. bacterial, virus, Rickettsial, etc. might possibly improve the continuity of the text.

The authors appear to have accomplished their purpose of presenting a "concise and handy description of certain common infectious diseases of children." The volume is clearly written, thoroughly up-to-date and reflects the scholarship of the writers. A second edition might well warrant the inclusion of other infectious diseases.

This text is a fine example of the bookmaking art. J.F.L.

WESEN UND BEDEUTUNG DER ENCHONDRALEN DYSOSTOSEN. By Dr. H. Mau and Dr. K. Lindemann. Cloth. Illustrated. Pp. 219. Price $6.40. Georg Thieme, Stuttgart, Germany 1958. In the United States, Intercontinental Medical Book Corporation, New York.

Under this title "Wesen Und Bedeutung Der Enchondralen Dysostosen," the author has attempted to link together a number of epiphyseal disorders, both localized and systemic in nature.

The well illustrated text is notable for its clarity and development.

Regarding the etiology, many of the conditions presented are as controversial now as they were when initially recognized. Our knowledge of their morphological pecularities on the other hand has always been much better founded.

The interest in this monograph should transcend the field of Orthopedics. H. BERGMANN, M.D.

STOWENS, D.: Sudden, Unexpected Death In Infancy. (Postgraduate Medicine, 23: A-52, June 1958).

More than 700 instances of sudden, unexpected death in infants and young children were studied. Only the lungs showed any alteration from the normal, the changes consisting of generalized overexpansion of the alveoli and pulmonary edema. Inflammation was not found. Evidence is presented to demonstrate that death was not the result of infectious disease. The hypothesis is advanced that death in these cases is the result of a generalized neural spasm mediated through the autonomic nervous system.

AUTHOR'S SUMMARY

PETERMAN, A. M., HAYLES, A. B., DOCKERTY, M. B. AND LOVE, J. G.: ENCEPHALOTRIGEMINAL ANGIOMATOSIS (STURGE-WEBER DISEASE). CLINICAL STUDY OF THIRTY-FIVE CASES. (Journal American Medical Association 167:2169 Aug. 30, 1958).

The clinical manifestations in 35 patients with encephalotrigeminal angiomatosis (Sturge-Weber disease) consisted of convulsions cutaneous angiomas, characteristic roentgenographic findings, mental retardation, ocular involvement, and hemiplegia, in that order of frequency. The case histories of four patients who underwent craniotomy show that two were markedly benefited by excision of the abnormally developed cerebral cortex and meninges. The variability of findings from patient to patient is noteworthy, as is the fact that in almost half the patients the course was not unfavorable. In patients who do not respond to anticonvulsant therapy, surgical excision of the diseased cerebral cortex may offer a good chance for recovery of normal activities and prevent the progression of neurological complications which occur in approximately half of the patients with this disorder. AUTHOR'S SUMMARY

FLANNERY, J. L.: SURVIVAL AFTER NEPHRECTOMY AND PARTIAL NEPHRECTOMY FOR BILATERAL WILM'S TUMORS. (United States Armed Forces Medical Journal 9-561, April 1958).

The possibility of survival after surgical removal of bilateral Wilm's tumors accompanied by appropriate preoperative and postoperative deep x-ray therapy is illustrated by report of a case. Seven and one-half years after removal of the right kidney and five years after resection of the left, the patient continues in good health, with no evidence of metastasis or recurrence. In spite of removal of two thirds of her normal kidney mass, her pattern of growth and development apparently is unaltered. AUTHOR'S SUMMARY

CARE OF THE PREMATURE INFANT. By Evelyn C. Lundeen, R.N. and Ralph H. Kunstadter, M.D. J. B. Lippincott Company, Philadelphia, Montreal. Cloth. Pp. 367 with 87 illustrations. Price

Pediatricians, nurses and others interested in the care of premature babies will greatly appreciate this volume, parts of which have formerly appeared under the title "The Premature Infant." by the late Dr. Julius Hess and Miss Lundeen. It contains a wealth of new material and depicts in detail the nursing technics and medical procedures employed Premature Infant Station at Michael Reese Hospital. These include chapters on requirements for the successful management of a premature nursery, equipment and the function of the personnel. The great value of breast milk feeding is stressed and feeding technics are outlined at length.

The book contains valuable chapters on the physiology, physical and mental growth of the premature infant, vitamins and hormones and such therapeutic procedures as oxygen therapy, transfusion, gavage and antibiotics. Other chapters deal with pathological conditions and their management, asphyxia, anoxia and cyanosis, erythroblastosis fetalis, diseases of the respiratory tract, of the stomach and intestines. M. WEICHSEL, M.D.

PRACTICAL PEDIATRICS. Edited by R. Cannon Eley, M.D., and Benjamin Kramer, M.D. Pages 309, cloth, McGraw-Hill Book Company, Inc., New York, 1958. Price $7.00.

The purpose of this book is to describe in simple language accepted practices and procedures in pediatrics which can readily be acquired and practiced by the general practitioner and to present those aspects of pediatrics which are most likely to challenge the practitioner in his every day practice.

Dr. Eley and Dr. Kramer provide important clinical information on cardio-vascular malformations, the premature infant, epilepsy, leukemia and diabetes in children. Excellent chapters describe the medical care of acute poliomyelitis and the management of meningitis. Poisoning in children is thoroughly and briefly discussed. The causes and treatment of vomiting in children are considered in detail, as well as the vitamin deficiency diseases.

Chapter VI, "Chemotherapy and Antibiotics," and chapter XXI, "Fluid and Electrolyte Balance", are of particular interest and value to the general practitioner. Another complete chapter is devoted to immunization procedures which are of utmost importance to the physician in his office practice. In fact, practically

every pediatric problem which would present itself to the general physician is included in "Practical Pediatrics."

The chapters on the treatment of contagious diseases, pulmonary tuberculosis and diseases of the genito-urinary tract are of primary interest and importance in our every day practice. Pneumonia, especially staphylococcus pneumonia, is discussed and the treatment thereof to date given. The collagen diseases including rheumatic fever are discussed with simplicity, interest and practical application. Allergy, infant feeding, growth and development are noteworthy chapters that present themselves frequently in every day practice.

This book with its current and extensive specialty information will be especially useful to the family doctor who so frequently encounters a wide variety of children's ailments in his day-to-day practice. Practical Pediatrics should be a part and requisite of every general practitioner's library. JOSEPH M. COVELLI, M.D.

PARISH, H. J., M.D., F.R.C.P.E., D.P.H., "ANTISERA, TOXOIDS, VACCINES AND TUBERCULINS IN PROPHYLAXIS AND TREATMENT." Published for The Wellcome Foundation Ltd. by E. & S. Livingstone Ltd., Edinburgh and London 1958, Fourth Edition. The Williams & Wilkins Co., Baltimore, exclusive U. S. Agents. Clothbound, 255 pages, illustrated. Price $7.00.

This small volume packs a lot of information in a series of brief, well organized chapters. All the more common uses of serologic materials for active and passive immunization and for treatment of infectious disease are described. Antivenom is included among the products discussed.

No attempt is made to cover the large field of the diagnostic uses of immunologic responses with the exception of the Schick, Dick and Tuberculin tests.

There are introductory chapters reviewing the basic facts of immunology and such practical matters as methods of administration, serum reactions and sensitivity testing.

Essentially, this is of course, a summary of English experience in the field, but practices of other countries are also frequently quoted particularly those obtained in the United States.

The actual bibliography is relatively short but throughout the text numerous additional sources are mentioned.

This is a useful little book to keep at hand for quick reference.

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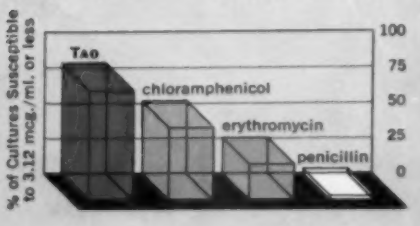
Per cent of "antibiotic-resistant" epidemic staphylococci cultures susceptible to Tao, erythromycin, penicillin and chloramphenicol.[1]



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REACTIONS:

(a) adults	(b) children
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References: 1. English, A. R., and Fink, F. C.: Antibiotics & Chemother. (Aug.) 1958. 2. English, A. R., and McBride, T. J.: Antibiotics & Chemother. (Aug.) 1958. 3. Wennersten, J. R.: Antibiotic Med. & Clin. Therapy (Aug.) 1958. 4. Celmer, W. D., et al.: Antibiotics Annual 1957-1958, New York, Medical Encyclopedia, Inc., 1958, p. 476.

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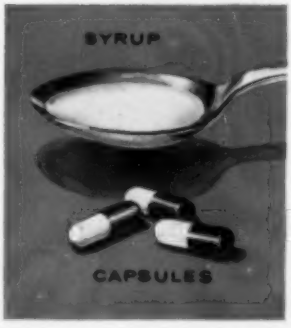

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